HP ProLiant DL145 Generation 2 Server
Installation Sheet

Read instructions completely before beginning installation procedure

Identifying Server Components

Front Panel Components
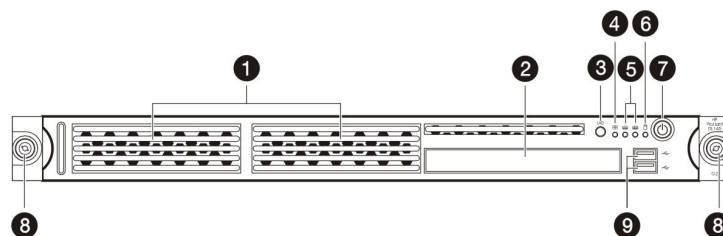
Table 1: Front Panel Components

Item	Icon	Component
1		Hard disk drive (HDD) bays
2		Optical media device bay
3	UID	Unit identification (UID) button with LED indicator (blue)
4		System health LED indicator (amber)
5		Activity/link status LED indicators for NIC 1 and NIC 2 (green)
6		HDD activity LED indicator (green)
7		Power button with LED indicator (bicolor: green and amber)
8		Thumbscrews for the front bezel
9		USB 2.0 ports

Rear Panel Components
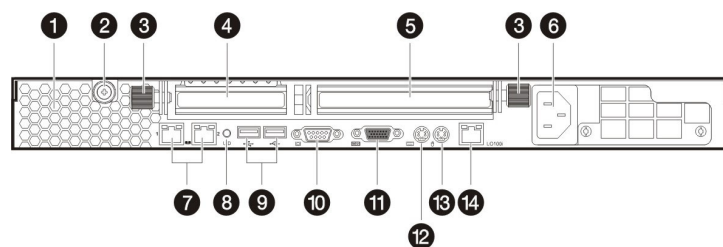
Table 2: Rear Panel Components

Item	Icon	Component
1		Ventilation holes
2		Thumbscrew for the top cover
3		Thumbscrews for the PCI riser board assembly
4		Low profile 64-bit/133 MHz PCI-X riser board slot cover
5		Standard height/full-length 64-bit/133 MHz PCI-X riser board slot cover
		Users can convert the PCI-X functionality of this slot to PCI Express using the PCI Express riser board option kit.
6		Power supply cable socket
7		GbE LAN ports for NIC 1 and NIC 2 (RJ-45)
8	UID	UID button with LED indicator (blue)
9		USB 2.0 ports (black)
10		Video port (blue)
11		Serial port (teal)
12		PS/2 keyboard port (purple)

Item	Icon	Component
13	🖱	PS/2 mouse port (green)
14	LO100i	10/100 Mbps LAN port for IPMI management (RJ-45)

NOTE: The three LAN ports each has its own LED indicators for activity/link status and network speed.
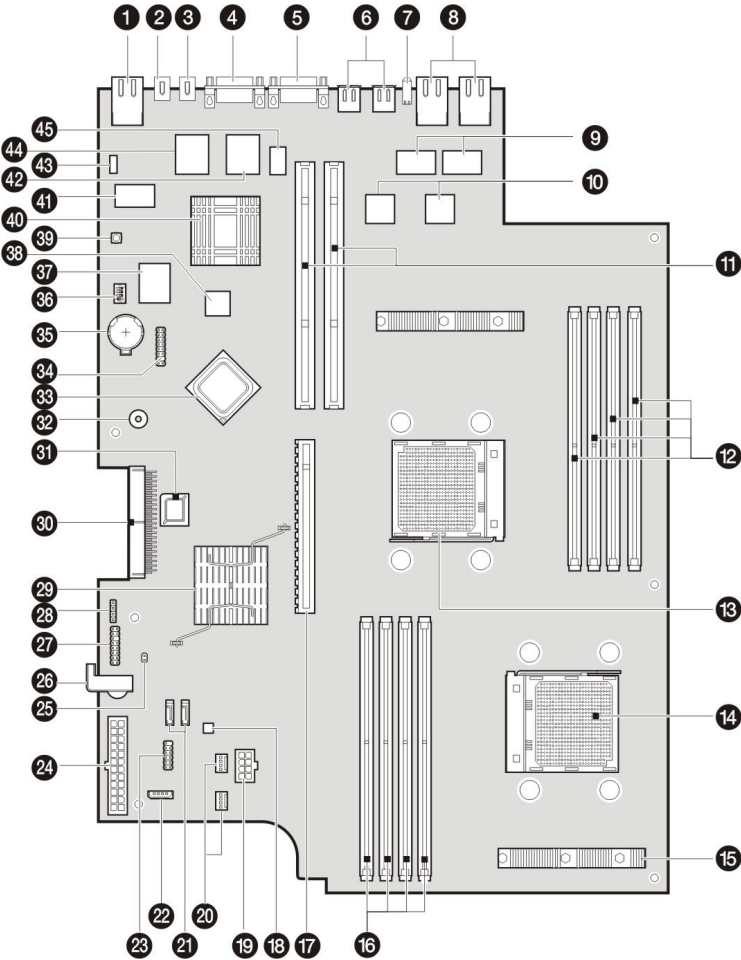
System Board Components

Table 3: System Board Components

Item	Component Code	Component
1	RJ1	10/100 Mbps LAN port for IPMI management
2	JK2	PS/2 mouse port
3	JK1	PS/2 keyboard port
4	CN13	Serial port
5	CN9	Video port
6	USB1 and USB2	USB 2.0 ports
7	SW3	UID button with LED indicator (blue)
8	LAN1 and LAN2	GbE LAN ports for NIC 1 and NIC 2
9	U20 and U27	Pulse H5007 XFORM 10/100 Base-T transformer modules
10	U23 and U30	Broadcom BCM5721 NetXtreme Gigabit Ethernet controllers A and B

Item	Component Code	Component
11	CN7 and CN8	64-bit/133 MHz 3.3 V PCI-X slots
12	DIMM1 to DIMM4	Processor 1 socket (U22) DIMM slots
13	U22	AMD Opteron 940-pin processor 1 socket
14	U11	AMD Opteron 940-pin processor 2 socket
15	—	Airflow regulator for system fans 1 through 4
16	DIMM5 to DIMM8	Processor 2 socket (U11) DIMM slots
17	U42	PCI Express x16 slot
18	U46	Analog Devices ADM1026 hardware monitor chipset
19	CN12	8-pin ATX processor power connector
20	FAN5 and FAN6	4-pin system fan connectors
21	SATA1 and SATA2	7-pin 150-MBps SATA connectors
22	CN21	4-pin I^2C connector for PSU
23	CN28	9-pin connector for the front USB 2.0 ports
24	CN22	24-pin ATX system board power connector
25	JP5	System reset
26	—	PCI retainer bracket
27	CN26	9-pin front panel board connector
28	CN29	4-pin SCSI cable LED connector
29	U54	NVIDIA Crush K8-04 Professional MCP (Media and Communications Processor)
30	CN27	IDE data cable connector
31	U74	BIOS flash EEPROM (Electrically Erasable Programmable Read-Only Memory)
32	BUZ1	Internal speaker
33	U55	AMD-8132 HyperTransport PCI-X 2.0 tunnel
34	CN25	LPC debug connector
35	BT1	3 V internal lithium system battery
36	SW2	System configuration switch (dip switch)
37	U79	SMSC LPC47M192 Super I/O chipset
38	U60	16 MB DDR SDRAM
39	SW1	NMI (non-maskable interrupt) switch
40	U56	NVIDIA GeForce2 MX400 GPU (Graphics Processor Unit)
41	U82	SMSC LAN91C113I-NC LAN controller (10/100 Mbps)
42	U52	BMC flash EPROM
43	CN23	BMC debug port
44	U67	QLogic Zircon UL BMC (Baseboard Management Controller)
45	U47	IC61LV25616-10T BMC SRAM

Server Configuration Guidelines

Observe the following important guidelines before performing any of the configuration steps listed in the next section.

- For safety information and detailed procedures related to step 3 of the "Server Configuration Overview" section, refer to Chapter 2 of the *HP ProLiant DL145 Generation 2 Server Maintenance and Service Guide.*

- For safety information and detailed procedures related to the rest of the steps listed in the "Server Configuration Overview" section, refer to relevant chapter on the *HP ProLiant DL145 Generation 2 Server User Guide.*

- Refer to the *HP ProLiant DL145 Generation 2 Server Support CD* for additional information and updates not provided in this installation sheet. You can also access additional information and documentation from the HP website at http://www.hp.com/, either by connecting directly or through the *Support CD*.

NOTE: The procedures described in this installation sheet assume that the server is out of the rack and is positioned on a flat, stable surface.

IMPORTANT: Observe the pre- and post-installation procedures described in later sections when performing any configuration procedure.

⚠ **CAUTION:** Follow the ESD precautions listed in Chapter 2 of the *HP ProLiant DL145 Generation 2 Server Maintenance and Service Guide* when handling any hardware component.

⚠ **WARNING: Failure to properly turn off the server before you open the server or before you start removing/installing hardware components may cause serious damage as well as bodily harm.**

⚠ **WARNING: To reduce the risk of personal injury from hot surfaces, allow the chassis and any installed hardware component to cool before touching them.**

Server Configuration Overview

The steps listed below give an overview of the necessary setup procedures for preparing the HP ProLiant DL145 Generation 2 server for operation.

1. Select an appropriate site for the server.

2. Unpack the server and rack-mounting hardware.

3. Install other options.

   Other options include additional memory, hard drives, expansion boards, and external storage devices.

4. Connect the power cord and peripheral devices.

5. Turn on the server and determine the BIOS version.

   Update the BIOS version if necessary.

6. Install a supported operating system of your choice.

   For detailed procedures, refer to the documentation provided by the OS vendor.

NOTE: For a list of operating systems supported by your ProLiant server, go to http://www.hp.com/go/supportos.

7. Install the rack rails.

8. Mount the server in the rack.

9. Configure the settings for the server's management functions.

   For detailed procedures, refer to the *Lights-Out 100i User Guide*.

Pre- and Post-Installation Procedures

Pre-installation Procedures

1. Turn off the server and all the peripherals connected to it.

2. Disconnect the AC power cord from the power supply cable socket located on the server rear panel to eliminate the risk of electrical shock.

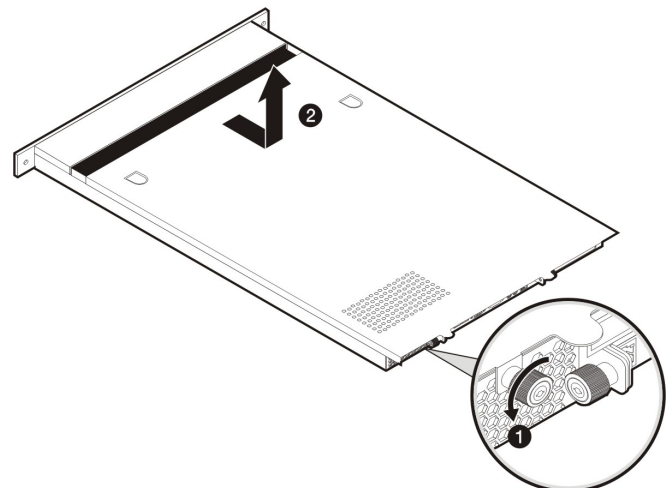3. Remove the top cover.

Post-installation Procedures

1. Be sure all components are installed according to the described step-by-step instructions.

2. Check to make sure you have not left loose tools or parts inside the server.

3. Reinstall any expansion board(s), peripheral(s), board cover(s), and system cable(s) that have previously been removed.

4. Reinstall the top cover.

5. Connect all external cables and the AC power cord to the system.

6. Press the power button ⏻ on the front panel to turn on the server.

Opening the Server

The top cover is detachable. You need to remove this cover before you can remove or replace a server component.

To open the server:

1. Perform steps 1 and 2 of the pre-installation procedures.

2. Detach the top cover from the chassis:

   a. Loosen the captive thumbscrew on the rear panel.

   b. Slide the cover approximately 1.25 cm (0.5 in) toward the rear of the unit, then lift the cover to detach it from the chassis.

3. Place the top cover in a safe place for reinstallation later.

Installing a Memory Module

The system has eight DIMM slots that support up to 16 GB maximum system memory (2 GB in each of the eight DIMM slots).
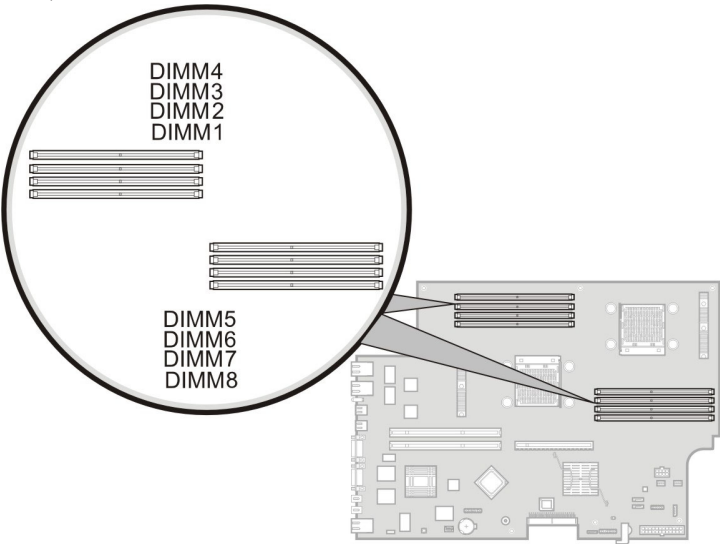

Memory Installation Guidelines

Observe the following important guidelines when installing memory modules:

- Use only HP supported PC3200 (400 MHz) registered ECC DIMMs in 512 MB, 1 GB, or 2 GB capacities

- In a single processor configuration, the processor 1 socket (U22) must be populated.

- The processor 2 socket (U11) must be populated before you can install memory modules in the DIMM5 to DIMM8 slots.

- Memory modules must be installed in pairs of the same size.

- Install memory modules following the slot sequence listed below:
  — For the processor 1 socket DIMM slots: Populate DIMM3 and DIMM4 first, then DIMM1 and DIMM2.
  — For the processor 2 socket DIMM slots: Populate DIMM7 and DIMM8 first, then DIMM5 and DIMM6.

To install a memory module:

1. Perform the pre-installation procedures described earlier.
2. If you intend to install a memory module in the DIMM5 to DIMM8 slots, lift the air duct away from the chassis first.
3. If necessary, remove any accessory boards or cables that prevent access to the DIMM slots.
4. Locate an empty DIMM slot on the system board.
5. If necessary, open the holding clips of the selected DIMM slot.
6. Remove the memory module from its protective packaging, handling it by the edges.
7. Install the memory module:
   a. Orient the module so that the notch on its bottom edge aligns with the keyed surface of the DIMM slot, and then press it fully into the slot.

      The DIMM slots are structured to ensure proper installation. If you insert a memory module but it does not fit easily into the slot, you may have inserted it incorrectly. Reverse the orientation of the module and insert it again.

   b. Firmly press the holding clips inward to secure the memory module in place.

      If the holding clips do not close, the module is not inserted correctly
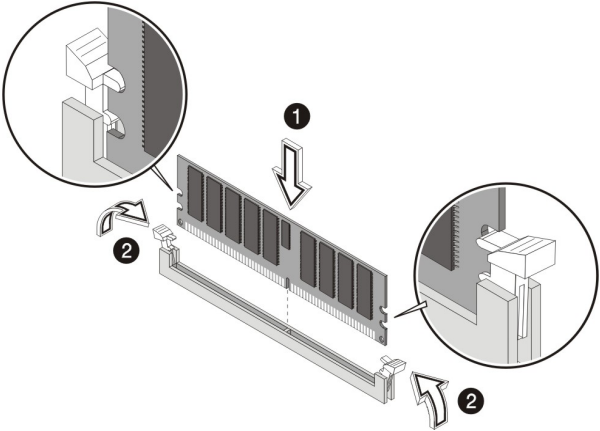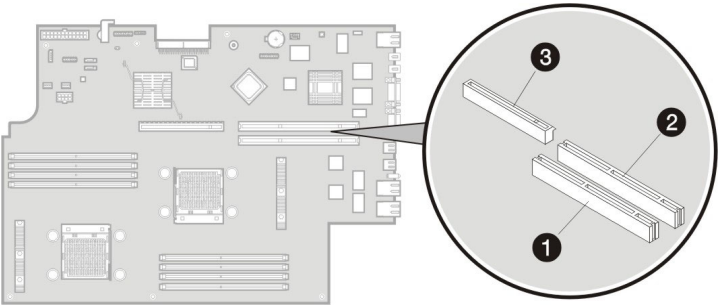

8. Perform the post-installation procedures described earlier.

Installing a PCI Expansion Board

Server I/O System Overview

System Board PCI Expansion Slots

There are three PCI expansion slots on the system board.

Item	Component	Function
1	64-bit/133 MHz PCI-X slot	Supports a low profile 64-bit/ 133 MHz PCI-X riser board
2	64-bit/133 MHz PCI-X slot	Supports a standard height/ full-length 64-bit/ 133 MHz PCI-X riser board
3	PCI Express x16 slot	Supports a full-length PCI Express x16 riser board

PCI Riser Board Expansion Slots

The two PCI-X riser boards attached to the PCI riser board assembly convert the functionality of the system board expansion slots to a pair of slots positioned at a 90° angle from the system board.
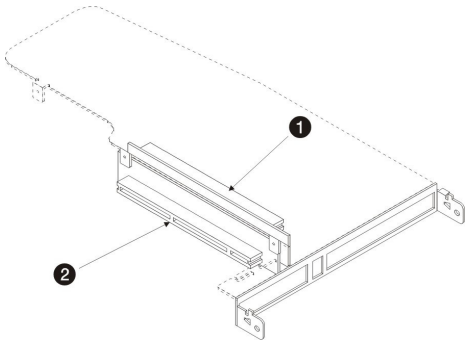
| Item	Component
1	Standard height/full-length 64-bit/133 MHz PCI-X riser board
	Users have the option to replace this riser board with a PCI Express model using the PCI Express riser board option kit. This will allow support for PCI Express x16 expansion boards.
2	Low profile 64-bit/133 MHz PCI-X riser board

Expansion Board Installation Guidelines

The system supports up to two expansion boards at a time. Use only HP supported expansion boards that meet the following specifications:

- PCI or PCI-X compliant
    — Connector: 32 or 64 bits wide, 3.3 V
    — Speed
        ▪ PCI board speed: 66 MHz
        ▪ PCI-X board speed: 100 or 133 MHz
    — Form factor: low profile or standard height/full-length boards
- PCI Express x16 compliant (available only when the optional PCI Express riser board is installed)

To install a PCI expansion board:
1. Perform the pre-installation procedures described earlier.
2. Remove the PCI riser board assembly:
    a. Loosen the two captive thumbscrews that secure the assembly to the chassis.
   b. Lift the assembly away from the chassis.
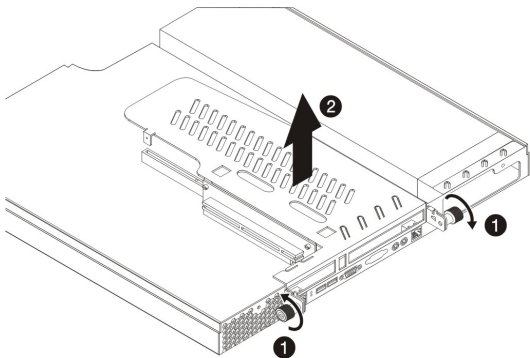
3. Identify the slot that is compatible with the expansion board you intend to install.

4. Pull out the slot cover from the selected slot.
   Store it for reassembly later.

⚠ **CAUTION:** Do not discard the slot cover. If the expansion board is removed in the future, the slot cover must be reinstalled to maintain proper cooling.
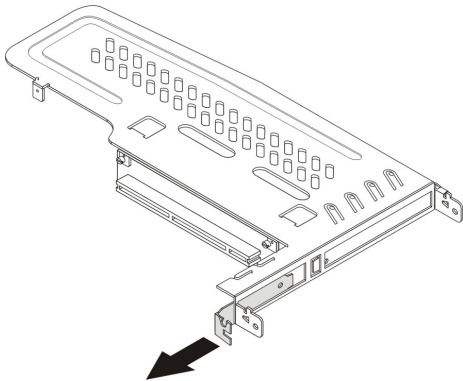

**Removing the cover of the low–profile expansion slot**
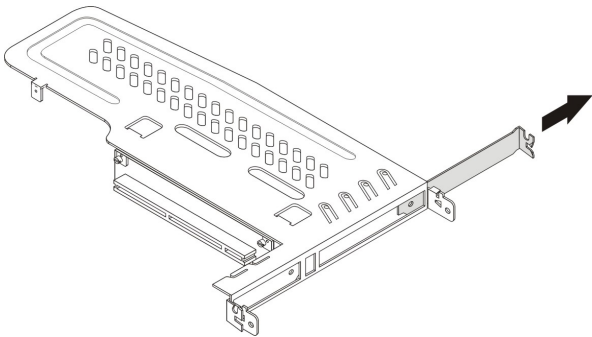
Removing the cover of the standard height/full-length expansion slot

5. Remove the PCI expansion board from its protective packaging, handling it by the edges.
   Some expansion boards can only be installed in one slot but other boards can be configured to fit in either slot by replacing the default bracket (attached to the board) with a different sized one. The different sized bracket and instructions on how to attach it to the board is included in the option kit.

6. Verify that the board's default bracket is compatible with the configuration of the selected slot.
   If it is not compatible, replace the bracket with one that is compatible.

7. Slide the expansion board into the slot.
   Firmly press the board to seat it properly on the slot.
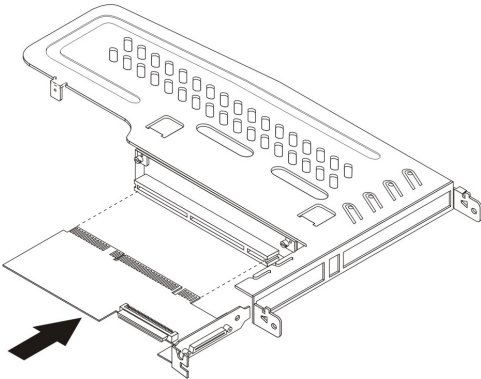
Installing the SCSI controller board in the low–profile expansion slot
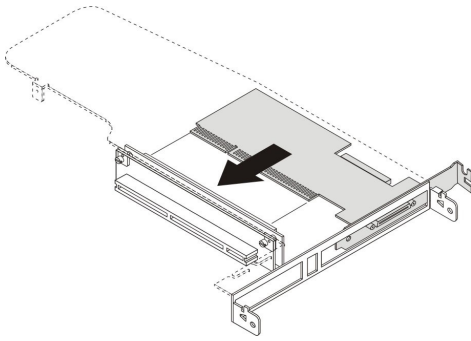
Installing the SCSI controller board in the standard height/full-length expansion slot

8. Connect the necessary cable(s) to the board.

   Refer to the documentation that came with the board.

9. Perform the post-installation procedures described earlier.

Installing a Hard Drive

The server's two 1-inch hard disk drive bays support both non-hot-plug SCSI and SATA drives. The default system comes with a single hard drive, the type and capacity of which varies based on the server model. The ProLiant server currently supports the following drive capacities:

- SCSI HDD
  — 36 GB
  — 72 GB

- SATA HDD
  — 80 GB
  — 160 GB
  — 250 GB

The SCSI drive and the 80 GB SATA drive options include only the hard disk. Use the HDD carriers and mounting screws included with your server to install these drives.

The 160- and 250-GB SATA drive options come with a hot-plug HDD carrier. You need to remove the drives from their default carriers before installing them in the server. Use the HDD carriers and mounting screws included with your server to install these drives.

Go to the HP website at http://www.hp.com/ and refer to the options list for this server model for the latest information on supported hard drives.

Hard Drive Installation Guidelines

Observe the following important guidelines when installing hard drives:

- Install only hard drive models specified for your ProLiant server. Installing unsupported hard drives may damage the system by consuming power and generating heat in excess of the server's operating tolerance. This condition may result in a loss of system and/or data integrity.

- Install hard disks in the drive carriers included with the server chassis using four of the six HDD screws pre-installed in each of the two HDD carriers.
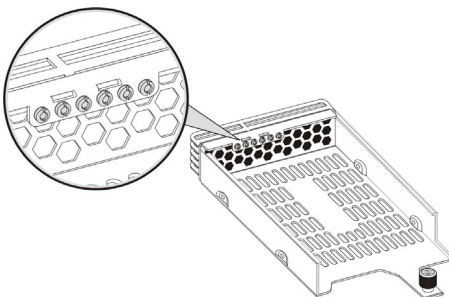
- Hard drives installed in the server are labeled as Device 0 and Device 1 from left to right when viewed from the front of the server.


0   1
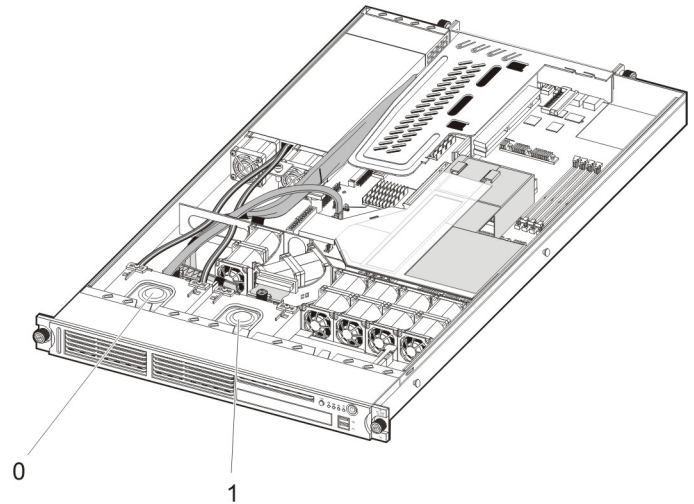
Removing a Hard Drive

If you intend to install a new hard drive in an occupied drive bay, remove the old drive first. Use the drive carrier and screws you removed from the old drive to install the new hard drive.

To remove a hard drive:

1. Perform the pre-installation procedures described earlier.
2. Disconnect the data and power cables from the rear of the hard drive.
3. Remove the hard drive from the chassis:
   a. Loosen the screw that secures the HDD carrier to the chassis.
   b. Push the HDD carrier towards the front of the chassis, then slide it out completely.
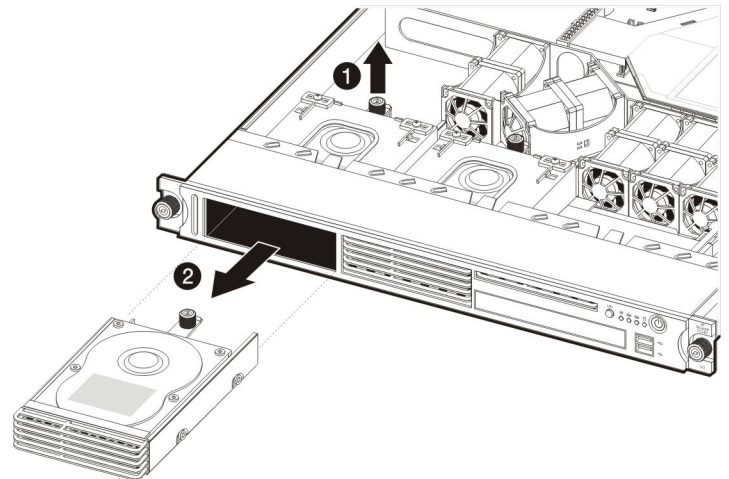
4. Remove the hard drive from its carrier:
   a. Remove the four mounting screws that secure the hard drive to the carrier.
   b. Remove the hard drive from its carrier.
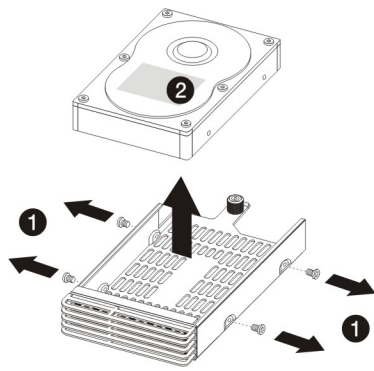
IMPORTANT: If you removed a hard drive without plans of installing a new one, you must reinstall the mounting screws at their pre-installed location for future use, then reinstall the HDD carrier in the chassis for the proper cooling of the system.

Configuring a SCSI Hard Drive

The steps listed below give an overview of the SCSI hard drive configuration procedure:

1. Install the SCSI hard drive.
2. Install the SCSI controller board.

   Refer to the "Installing a PCI Expansion Board" section for detailed procedures.
3. Route the SCSI drive cables.

   Refer to the *SCSI Cable Installation Instructions* document that came with the SCSI cable option kit for detailed procedures.
4. Set up the SCSI configuration.

   Refer to the documentation that came with the SCSI controller board for detailed procedures.

To install a SCSI hard drive:

1. Perform the pre-installation procedures described earlier.
2. Select which drive bay you will use to install the new hard drive.

   If the desired drive bay is occupied, remove the currently installed drive following the procedures described in the "Removing a Hard Drive" section.

   If the desired drive bay is empty, perform step 3 of the "Removing a Hard Drive" section, then remove four mounting screws from the HDD carrier. You will use these screws to install the new drive.
3. Install the new SCSI hard drive in its carrier:

   If you are installing the new drive in a previously occupied drive bay, use the HDD carrier and mounting screws you removed from the old drive.

   If you are installing the new drive in an empty drive bay, use the HDD carrier and mounting screws you removed from that drive bay.

   a. Align the new hard drive on the carrier.
   b. Secure the hard drive assembly with the four mounting screws.
   c. Slide the hard drive assembly into the chassis.
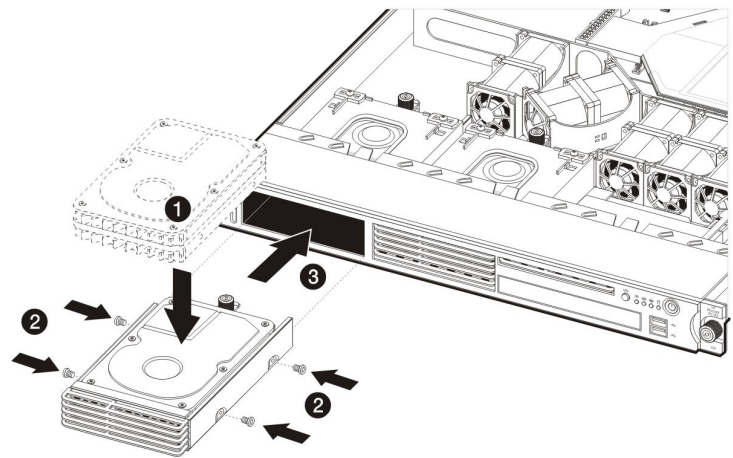
Configuring a SATA Hard Drive

Configuring a SATA hard drive is a two-step process that includes:

1. Install the SATA hard drive.
2. Set up the SATA configuration.

   For detailed procedures, refer to the *Server Support CD* or to the operating system documentation.

To install a SATA hard drive:

1. Install the SATA hard drive by following the steps described in the "To install a SCSI hard drive" section.

> **CAUTION:** Route the SATA drive cables neatly. If necessary, secure them using the pre-installed cable clips located on the chassis base. The cables should be routed in a position where they will not be pinched or crimped by the top cover, nor should they hamper proper airflow inside the chassis.

2. Route the SATA drive cables:

   a. Route the SATA and power cables through the cable management opening of the chassis' partition wall.
   b. Connect the SATA and power cables to their corresponding connectors on the rear of the new drive.
   c. Check that all cables are clear of the hard drive carrier and are properly routed to their corresponding connectors, then tighten the screw that secures the hard drive assembly to the chassis.
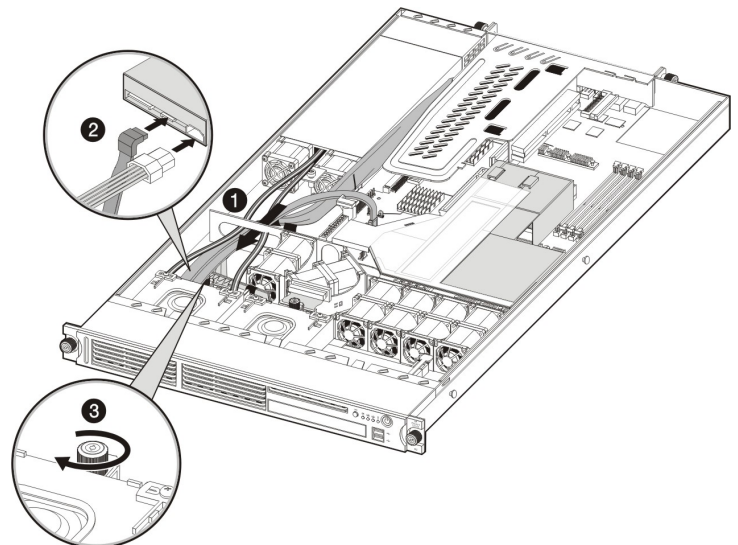
3. Perform the post-installation procedures described earlier.

Installing an Optional CD-ROM or DVD Drive

The optical media device bay supports the installation of a slim-type CD-ROM or DVD-ROM drive. Go to the HP website at http://www.hp.com/ and refer to the options list for this server model for a list of supported optical media drives.

To install an optional CD-ROM or DVD drive:

1. Perform the pre-installation procedures described earlier.
2. Prepare the optical media device bay for installation:
   a. Pull up the optical media device bay release lever, then push the drive carrier partially out through the front of the chassis.
   b. Pull the drive carrier out of the chassis.
   c. Remove the screw securing the drive carrier bezel.
   d. Detach the drive carrier bezel.
      Store the drive carrier bezel (with its screw) for reassembly later.

   CAUTION: Do not discard the drive carrier bezel. If the optical drive is removed in the future, this bezel must be reinstalled in the chassis for the proper cooling of the system.
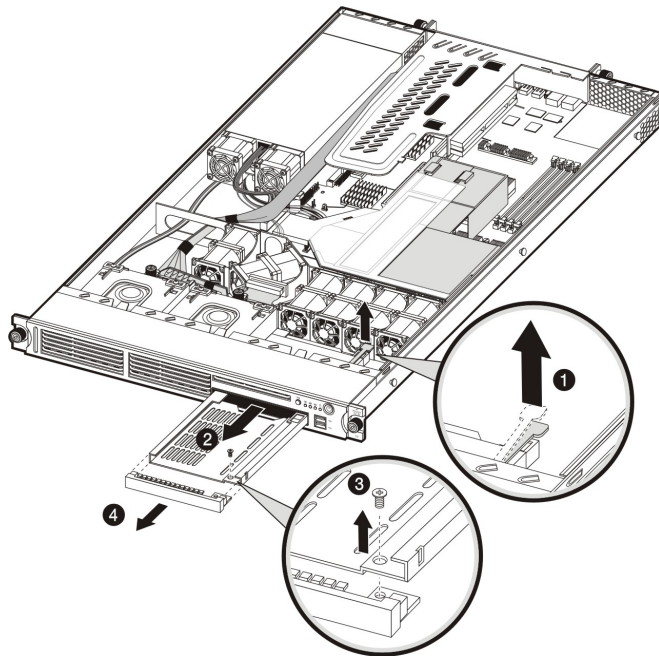
3. Remove the new optical drive from its protective packaging.
   The optical drive option kits include mounting screws for drive installation.
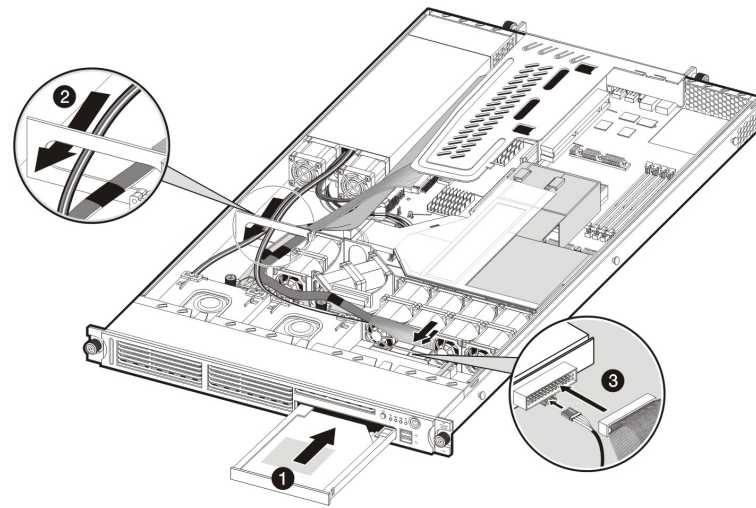
4. Install the new optical drive in its carrier:
   a. Align the optical drive in the carrier.
   b. Secure the drive with two mounting screws.
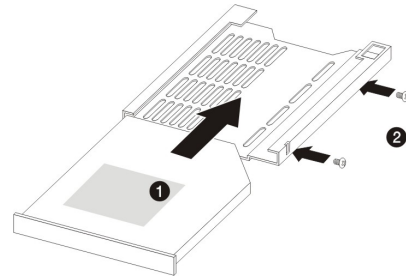
5. Install the new optical drive into the chassis:
   a. Slide the drive assembly into the chassis until the optical media device bay release lever snaps into place.

   CAUTION: Route the optical drive cables neatly. If necessary, secure them using the pre-installed cable clips located on the chassis base. The cables should be routed in a position where they will not be pinched or crimped by the top cover, nor should they hamper proper airflow inside the chassis.

   b. Route the optical drive's power cables through the cable management opening of the chassis' partition wall.
   c. Connect the IDE data and power cables to their corresponding connectors on the optical drive's backplane board.

6. Perform the post-installation procedures described earlier.